Warnings

• We strongly **recommend** to calibrate the throttle range of transmitter when you first use the controller or when using a new/different transmitter or receiver.

• When connecting the ESC to battery pack, please ensure the polarity is correct. Incorrect polarity may cause permanent damage to the ESC and such damage is not covered by manufacturer's WARRANTY.

• When you use the ESC, turn on the transmitter BEFORE powering on the receiver.

• When you finish the flying, power off the receiver BEFORE turning off the transmitter.

• The limiting current is set to the 'standard mode' in factory. It is suitable for use in most configurations. Only experienced technicians can adjust this programming.

• In Governor Mode, the brake is always disabled and the soft cutoff is always active.

• Changing the PWM may cause the motor to heat ahead of time.

• Never disconnect the battery pack while the motor is running, as this could cause damage to the speed controller and/or motor.

• Connectors with low conductivity may cause erratic motor rotations or other unexpected movements.

• If you do not use the BEC function of the ESC and are using a separate receiver pack or UBEC to power receiver and servos instead, please disconnect the red wire from the ESC's receiver lead.

• Due to adopt advanced switching BEC technology, the switching frequency of the on-board BEC may make some disturbance to receiver when use with some of 35Mhz transmitters and receivers, (such as Multiplex 35Mhz transmitter and receiver). We strongly recommend to disconnect the red wire from the ESC's receiver lead and use a separate receiver battery to power the receiver and servos *when* use with some of 35Mhz transmitter and receiver.

• The controller will automatically power off the motor if the battery voltage drops below the programmed cut-off voltage (factory preset at 6.0V). Try using a smaller prop on the motor, or using batteries with a higher rating. It is especially important for the user of Li-poly cells.

• Allowing water, lubricants, moisture or other foreign objects inside speed ESC will VOID the WARRANTY. Exposure to CA glue or its fumes can cause damage and malfunctions; this will also VOID the WARRANTY.

Ⅰ **Introduction**

The Eurgle controllers are outstanding and unique products in the R/C industry. They represent a great advance in electric flight by integrating a data logger with an electronic speed controller. There is no need for a separate logging device if you have a Eurgle controller! In addition, software updates for the controller can be downloaded from the Internet so your controller will never become obsolete. The give you all the data you need to be sure your aircraft is set up for its optimum performance. With the , all you have to do is going to fly and having fun!

Ⅱ **Unique Features**

• Supports the 'Eurgle USB Linker' to program the ESC by computer.

• The firmware of the ESC can be upgradeable from Internet as the new version of the software becomes available.

• Innovate intelligent Governor Mode, especially for 3D helicopter. Please see appendix for more details.

• Integrated with the flight data logger, records data for the ENTIRE flight such as:
  - Voltage
  - Current
  - Temperature
  - Motor RPM
  - Throttle travel

• Compatible with Eurgle Program Card and Eurgle Program Box.

Ⅲ **Specifications**

• Microprocessor controlled

• Extremely low resistance

• 80A continuous (90A surge)

• Up to 20cells NiCad/NiMH or 2~6 cells Lithium-Polymer

• High rate adjustable switching (PWM: 8KHz/12KHz/16KHz)

• BEC: 5V, max 4A (switching BEC)

• Supports above 4 digital servos

Ⅳ **System Requirement**

• Personal Computer with WINDOWS 2000 or WINDOWS XP operation system

• CD-ROM drive (or access to Internet)

• USB port available

• 4 Megabytes hard disk space

• Computer screen resolution with 800×600, 1024×768 (*Recommend*), 1280×1024.

Ⅴ **Hardware**

There are not any more accessories needed, just the Eurgle ESC-80A，Eurgle 'USB Linker' and a Eurgle setup CD. It is easy to use for everyone from beginner to expert.

Eurgle ESC-80A

USB Linker

Setup CD

Ⅵ Using the ESC

・**Calibrate the throttle range of transmitter at the first time to use the controller** *(Recommend)*

   - Correctly connect the ESC with brushless motor, plug the receiver lead of ESC into receiver (usually into Channel 3);
   - Put the throttle to the highest position, turn on the transmitter;
   - Power on the receiver, ESC and motor. There are 3 beeps emitted from the motor, which indicates all electronics are correctly power on for the setting.
   - Then there are 4 long beeps emitted from the motor ♪ ♪ ♪ ♪ .
   - During or after the 4 long beeps , move the throttle to the lowest position, at this point, you have calibrated the throttle range of your transmitter;
   - Waiting one second, there will be two beeps emitted from the motor   ♪ ♪

> **NOTE: 1).** If you have succeeded in calibrating the throttle range of transmitter, the throttle range will be displayed in **'Programming Set' window** when you connect the controller to PC. The factory preset throttle range is 640 uS.

   - Calibration of throttle is completed.

・**Program the ESC' s settings or use the default setting (by Eurgle Program Card/ on PC/ by throttle stick)**

   Recommend: Please always clearly know current parameters of ESC before use, and program it according to your configuration. Please take the following form as reference to program the ESC (Default setting is displayed in blue. Throttle range in gray cannot be programmed but be auto changed after calibrating the throttle travel of trans-

LVC	Auto	5.0V	6.0V (2 Lipo)	7.2V	8.4V	9.0V (3 Lipo)	12.0V (4 Lipo)	15.0V (5 Lipo)	18.0V (6 Lipo)	
Current Limiting	Sensitivity		Standard		Insensitivity		Disabled			
Brake Type	No brake		Soft brake		Hard brake					
Timing Advance	Auto		Low		Middle		High			
Cutoff Type	Hard cutoff		Soft cutoff							
Start Type	Soft start		Standard		Fast start					
Governor Mode	Auto		Governor Low		Governor High					
PWM Rate	8KHz		12KHz		16KHz					
Throttle Range	640 uS									

mitter.) Seeing the appendix about the detail programmable features of Eurgle ESC-80A.

> **NOTE: 1)** You also can program the ESC-80A through Eurgle Program Card. Please read the manuals of 'Eurgle Program Card' for more detail instructions.
>   **2)** When program the settings by throttle stick of transmitter, please refer to the way described in the manuals of Eurgle ESC-75A-G-SE.

 • In order to well record the flight data and utilize the storage of the logger, please set the **'Recorder Configu-ration'** in the menu of **'Data Logger'** after installing the Eurgle software. (see instructions in Ⅸ）

 • When you finish the setting, repower the ESC, receiver and motor, there are two beeps emitted from the motor, then is ready to go fly and enjoy the flying.

Ⅶ <u>Installing Eurgle Software</u>

 • Insert the CD in the CD driver of the computer.
 • Double click the **'Setup'** icon

NOTE: Never plug the USB Linker to USB port of PC BEFORE installation of software is successfully completed.
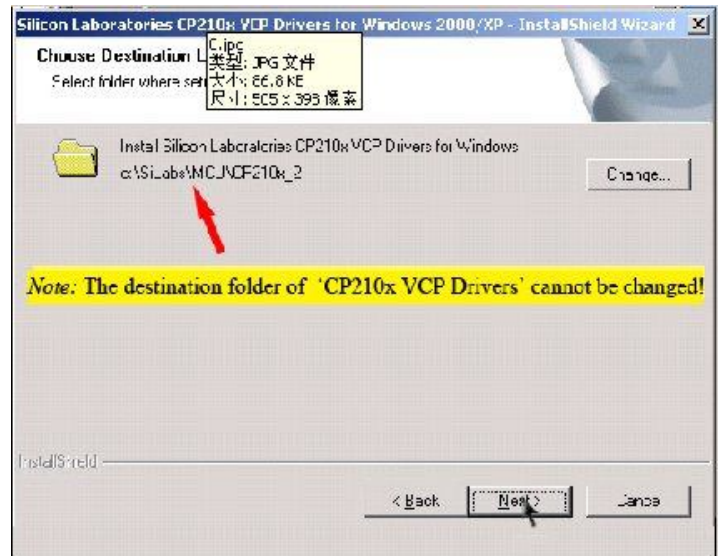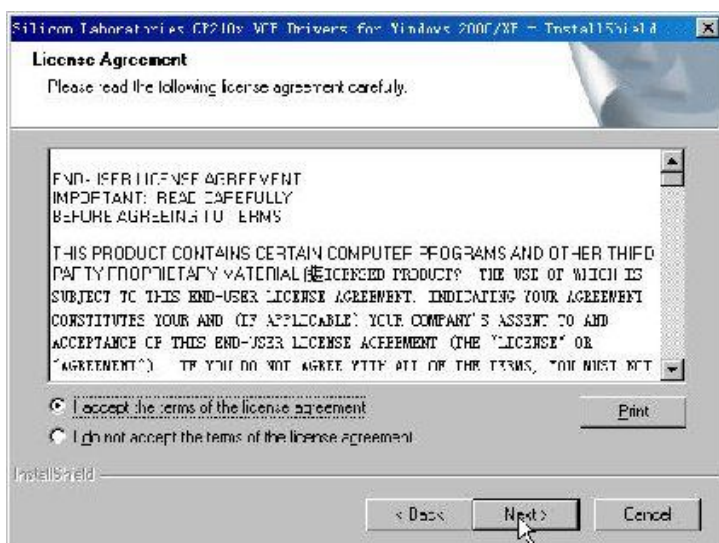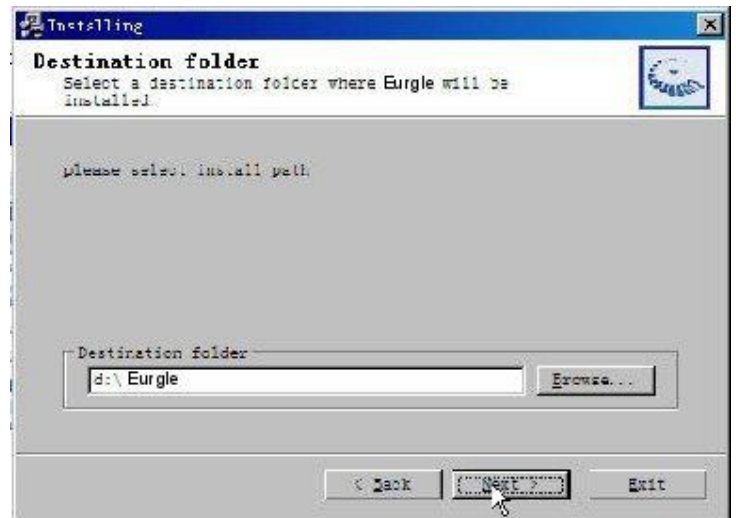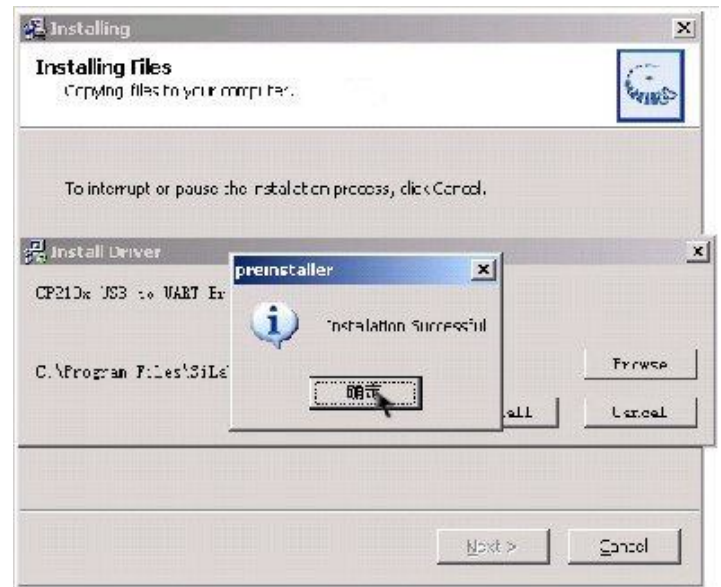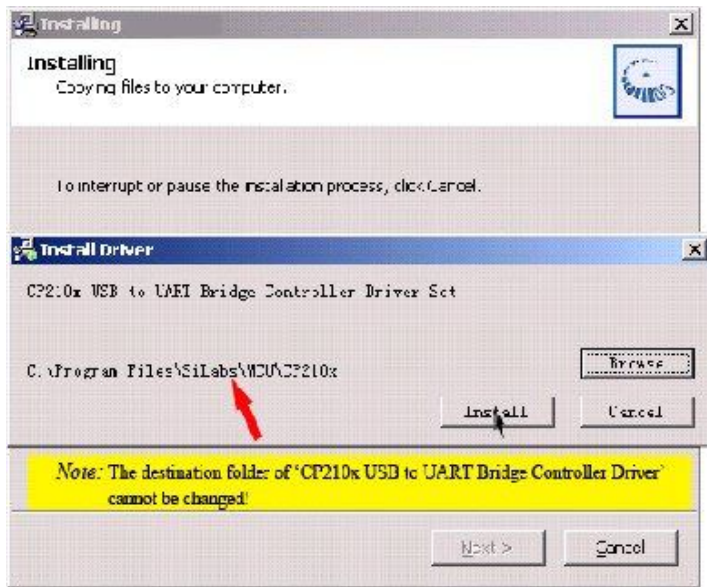
• After you click the **'finish'** button**,** there will be an icon **'Eurgle'** on your computer desktop.

• Installation complete.

> *NOTE:* These two destination folders are both default and cannot be changed, otherwise the software cannot work normally.

# Ⅷ How to connect the controller to PC

• Plug the *receiver lead* of ESC-80A into the Eurgle USB Linker, please pay attention to the polarity for correct connection. (Seeing the label on the USB Linker) .

• Connect the USB Linker to one of available USB ports of your computer. A little red LED on USB Linker will light up. At the same time, a green LED on the controller would light up when correctly connected, otherwise not

> *NOTE:* The receiver lead of Eurgle controllers are consisted of three small colored wires and adopt JR wire configuration, i.e, red (+), brown (-) and orange (signal)

Ⅸ Using the software

 • Open the software by double clicking the icon **'Eurgle'** on your desktop.
 • Select the com port by clicking the menu of **'Port Num.'***
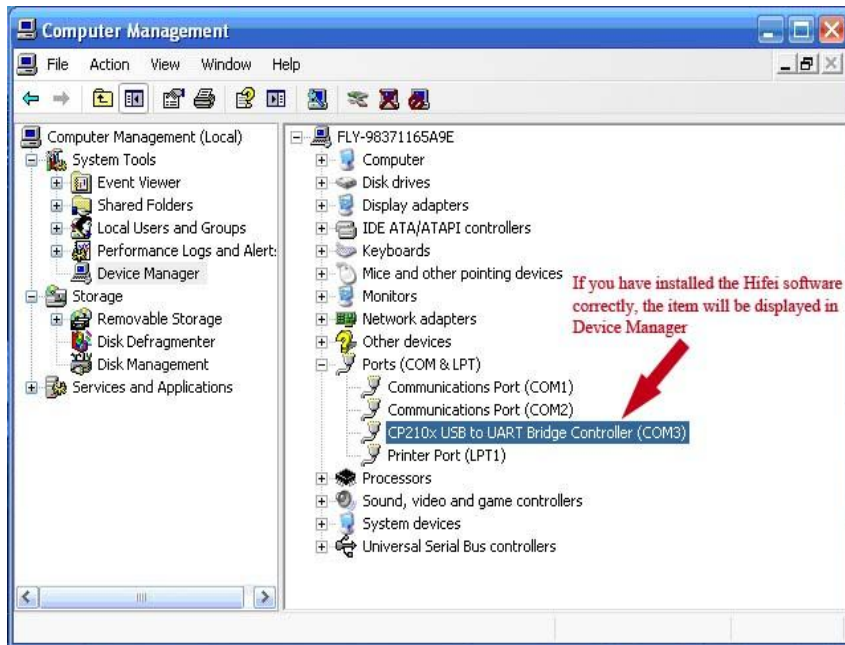

*The com port is generally 'com 3' or 'com 4,' but there are respective com ports on different computers. You can find the accurate com port on your computer in this way: Click the right button of mouse the icon 'My Computer' →Manage → Device Manager →Ports(Com & LPT). Choosing the CORRECT com port in the menu of 'Port Num.

 • Click the **'Connect Device'** button. If the connection is correct, the menu with **'Upgrade'** and **'Programming set'** will be highlighted. The ESC Software Version information also will be displayed..

Data display area
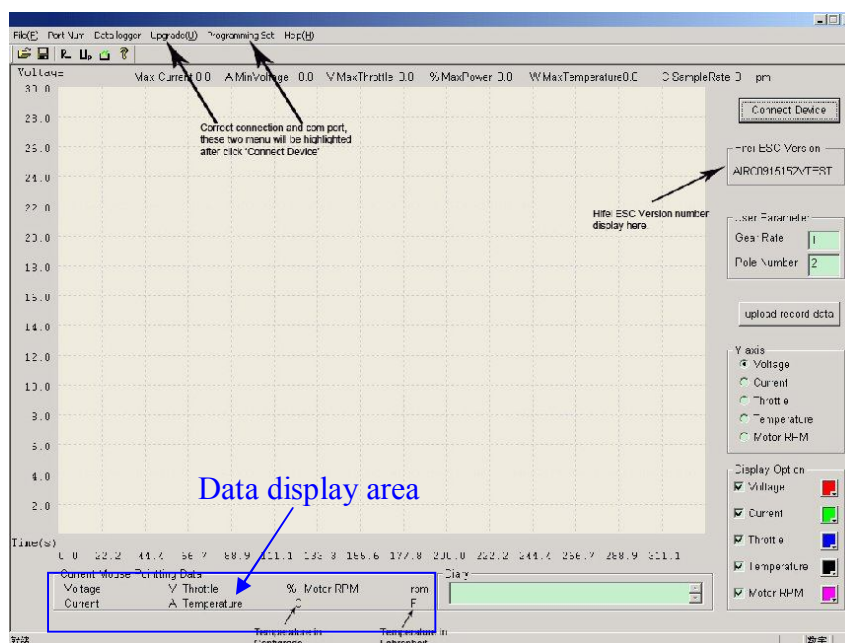
• **Programming the parameters of the ESC:**

- Select **'Programming Set'**. (also the Shortcuts button ⬆️)
- Click **'Connect'** button or **'Reading Data from ESC'** button to read out the current parameters of controller, and the firmware version is also displayed below.
- Select the parameters you wish to set.
- Click the **'Update'** button to save the modification.
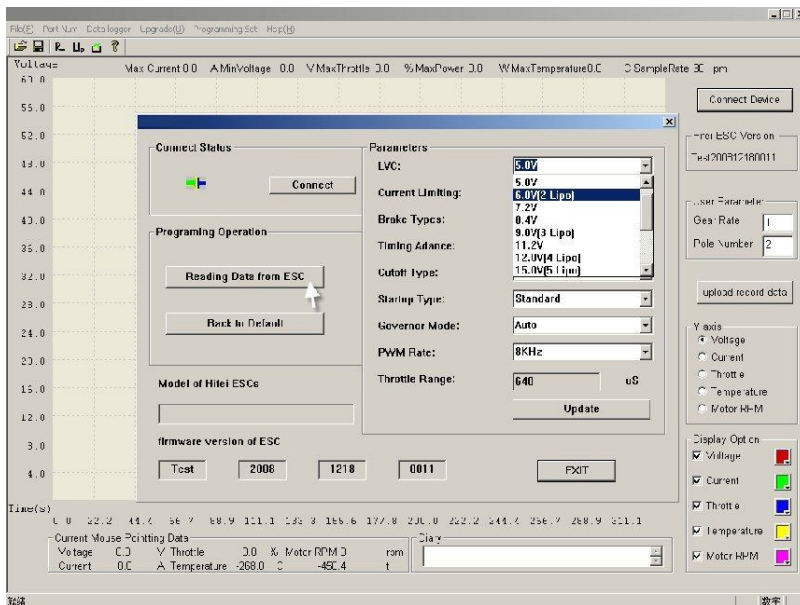
- Clicking the **'Back to default'** button will modify the parameters of ESC to factory default.

NOTE: Please set the parameters always after current parameters of ESC is displayed in window and according to the instructing turn, otherwise programming of ESC will be defeated and ESC will still keep the parameters set in last time.

• **Updating the firmware of the ESC**

- Click the **'update'** menu (the Shortcuts button ⬆️)
- Click the **'Get ESC's Ver'** button, which will display current version number.
- Click the 'Open' button to achieve the upgradeable software*, which can be downloaded from Internet.
- Click the 'Start' button to upgrade the firmware of ESC to new version.
Firmware upgrade will be finished in 3-5 seconds.

*A new upgradeable version of software can be downloaded in **www.Eurgle.com** when it is available.
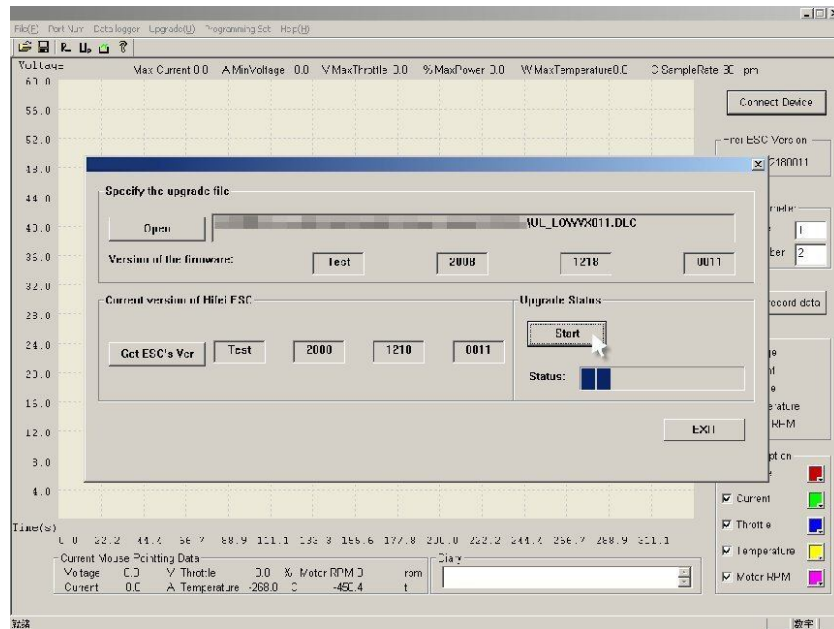
- **Reading the flight data from the ESC-80A**

    - Make sure to input the correct parameters in the area of **'User Parameter'**: **Gear Rate and Magnet Poles number of motor** (the default value is: 1 and 2), it is very important to get the correct motor RPM information.

    - Click the **'upload record data'** button to upload the flight data from the controller.

    - After clicking the 'upload record data' button, the flight data in ESC will be shown as curves in the display window.
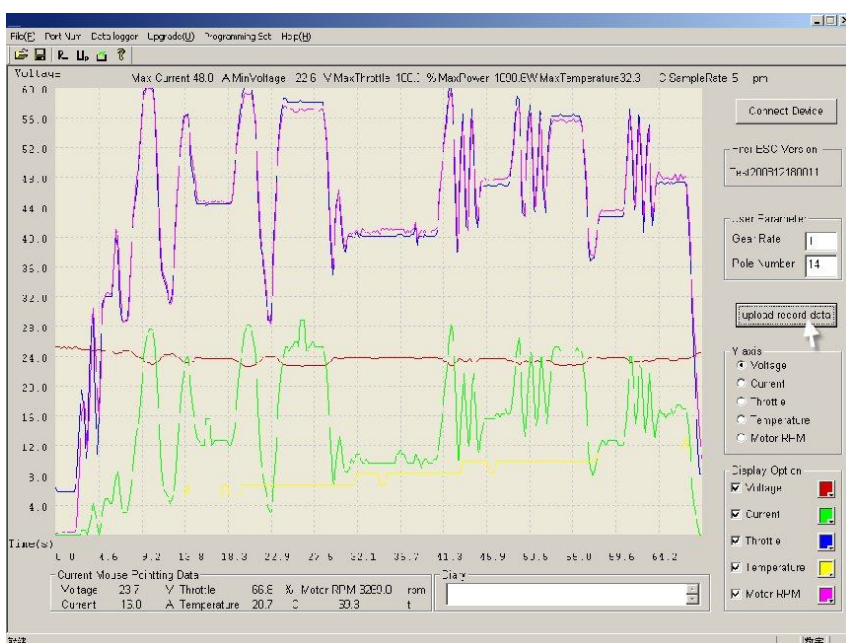
- In the display window, you can choose a range of curves to analyze clearly by clicking the left button of mouse from start side to the end side of your chosen area, such as the below diagrammatic curves, data recorded from the 22.9 second to the 36.7 second as the chosen analyzing area (the area shown in translucent):
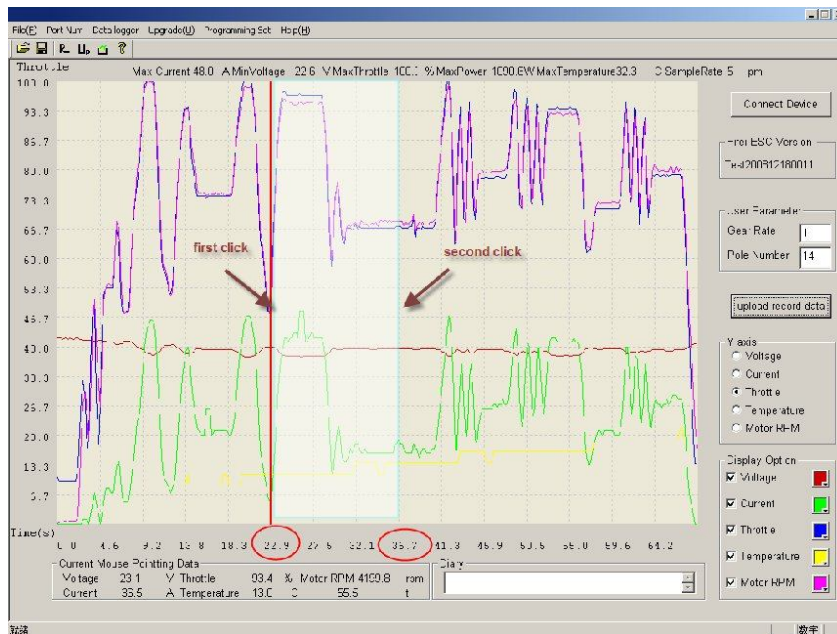
- Much clearer curves of the chosen area is displayed:

- Click the right button of mouse to display the original curves.

NOTE: 1) The software always displays the latest flight data.

　　2) Wherever the mouse points, a groups of data displayed below in the 'data display area' indicates current, voltage, throttle, motor RPM and temperature on the point. The data within the 'data display area' is changing when the mouse is dragging.

- **Changing the recording parameters**

Recommend: In order to well and accurately record the flight data, please know and program the recording configurations first before use, otherwise may cause losing of some data.

- Click the menu **'Data Logger'**.

    - **'Recorder Configuration'** (Shortcuts button ![R]) .
- Click **'Connect'** button to display current configuration.
- Sampling Rate (1,2,3,5,10,20,30) times/a second.*****

*The default sampling rate of ESC-80A is 3 times in a second. The possible recording time is decided by the storage and set sampling rate. The longest recording time is 68 minutes.

Sampling Rate	Possible Recording Time	Minimum Flying Time
Once/ a second	Approx. 68.1 minutes	〉 60 seconds
Twice/ a second	Approx. 34.05 minutes	〉 30 seconds
3 times/ a second	Approx. 22.7 minutes	〉 20 seconds
5 times/a second	Approx. 13.62 minutes	〉 10 seconds
10 times/a second	Approx. 6.81 minutes	〉 5 seconds
15 times/a second	Approx. 3.405 minutes	〉 3 seconds
30 times/a second	Approx. 2.27 minutes	〉 2 seconds

Possible Recording Time means longest time the recorder can record with the set sampling rate.
Minimum Flying Time: with the set sampling rate, the minimum flying time of ESC should be more than the listed in above form, otherwise the software can not read out and display the data on the PC window.

-
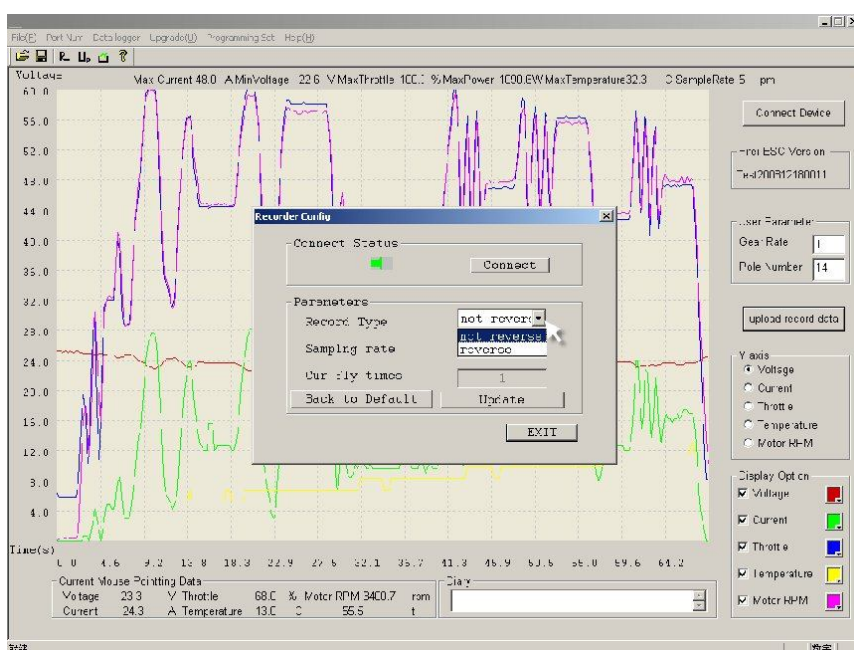
Record type. **'Not reverse' and 'reverse'**.*****

*'Not reverse' indicates the data logger cannot record any more when the space is filled up; 'reverse' indicates the data logger can record indefinitely by overlapping the former data and do a cycle. 'Not reverse' is default.

- **'Cur fly times'** button is never highlighted.*

*'**Cur fly times' button records the times you have flown. The ESC can record most 16 times flying. You can clear it by clicking the 'Clear Logger Data' button. That battery in power is calculated as once.**

- Select the configuration you wish to set, and click **'Update'** to save modifications.

- Click the button **'Clear Logger Data'** to clear the data in the ESC for enough space to record for the next flying.

We *Recommend* to always clear all data before next flying, and to save the useful data as a file on PC before clearing.

- Click **'Color Set'** button to set the displaying color and line width according to your favor, and click **'SAVE'** button to save the modifications.
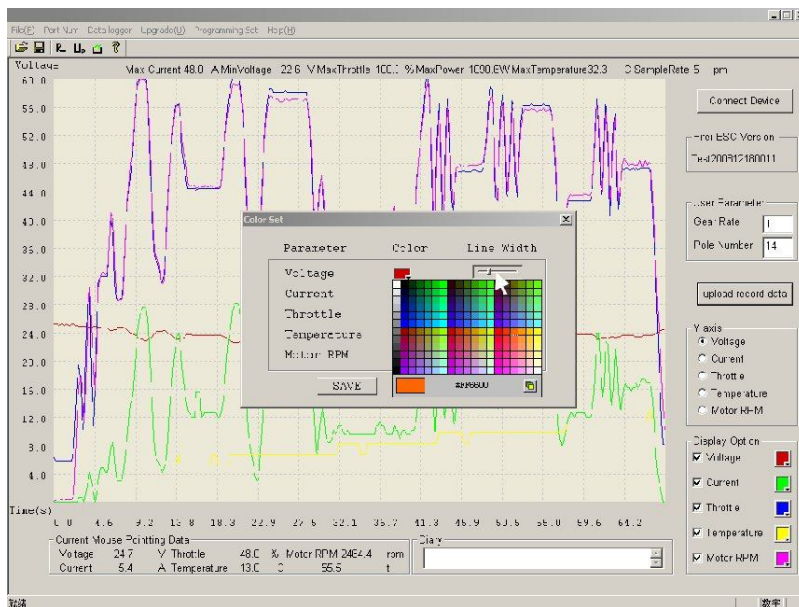
• **Changing the display channel**

- Y axis reference

The 'X' axis presents the flying time, but the 'Y' axis can present the corresponding numerical value according to your selected category in the 'Y axis' zone.
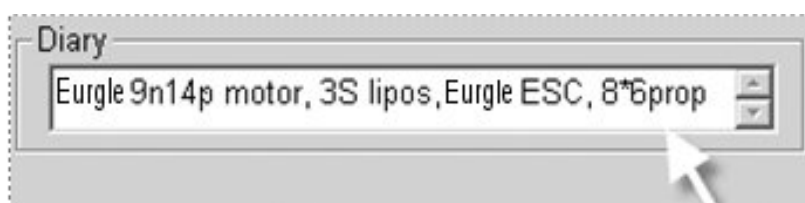
- Parameter color
- Diary
- Save the flight data. Click the menu **'File'** to save data on PC.

• **Diary panel**

The logbook can be filled in ' Diary ' window.

Writing down some illustration about the power system or your opinions or feelings in the diary panel and save it just like your private flying diary.

Appendix

Eurgle ESC s offer eight user programmable features, including low cutoff voltage, current limiting, brake type, timing advance, cutoff type, soft start, governor mode and PWM switching rate. Through the USB Linker, Eurgle ESC-80A can be programmed easily on PC, and it is also good compatible with Eurgle Program Card or program via throttle stick of the transmitter.

- Low Cut-off Voltage

Option 1:Auto Lipo	Auto Lipo Cells Detecting
Option2:6.0V(default)	6-8 cell NiCad or NiMH packs, or 2 cell Lithium packs
Option 3:7.2V	8 cell NiCad or NiMH packs, or 2 cell Lithium packs
Option 4:8.4V	9 cell NiCad or NiMH packs
Option 5:9.0V	10 cell NiCad or NiMH packs, or 3 cell Lithium packs
Option 6:12.0V	4 Lipo cells
Option 7:15.0V	5 Lipo cells
Option 8:18.0v	6 Lipo cells

NOTE: Low Cut-off Voltage can protect the main battery from being discharged too low, and provide the normal operating voltage to receiver and servos.

- Current Limiting

Option 1: Very Sensitivity	Low over-current threshold, will rapidly shut-down.
Option 2:Standard(default)	Moderate over-current threshold, will shut down after a slight delay. Recommended for inrunner motors.
Option 3:Insensitivity	High over-current threshold, will shut down after a slight delay. Recommended for outrunner motors. **Only experienced modelers should use this programming feature**
Option 4: disabled	Current limiting detection disabled. **Only experienced modelers should use this programming feature.**

NOTE: Default setting is recommended. If you change the setting, damage to the controller as a result of over current will be not covered by the manufacturer's warranty.

- Brake Type

Option 1:Brake disabled (default)	Brake disabled is mainly used for helicopters.
Option 2:Soft brake	Soft brake provides 50% of full braking power. General aircraft use, with fixed or folding prop
Option 3:Hard brake	Hard brake is 70% braking power. Direct drive applications where more braking power is required. Hard brake should only be used below 12V.

- Timing Advance

Option 1: Low advance timing 0°~15°	
Option 2: middle advance timing 5 °~ 20 °	Recommended for most motors .Gives a good balance of power and efficiency.
Option 3: High advance timing 15° ~ 30 °	Recommended for most of higher pole count motors
Option4:Auto(default)	Recommended for most of all brushless motors.

- Cutoff Type

Option 1 :Hard cutoff (default)	When battery voltage reaches cut-off voltage the motor will shutdown immediately. Motor can be restarted by closing the throttle to the lowest position and then move the throttle as normal
Option 2: Soft cutoff	When battery voltage reaches cut-off voltage, the ESC will slowly reduce motor power to zero, you will notice a decrease in power and it is time to land, the throttle maintains its full linear response.

NOTE: Soft cutoff is always automatically active in Governor Mode.

- Start Type

Option 1: soft start	Recommended for helicopters
Option 2:standardstart (default)	Recommended for most of the fixed or folding prop airplanes, and some helicopters.
Option 3: Fast start	Recommended for fastest startup.

- Governor Mode

Option 1: Auto calibrating throttle (default)	Recommended for general aircraft
Option 2: Governor Low	For helicopter application. Controlling frequency becomes slow, control gain becomes increasing.
Option 3: Governor High	For helicopter application. Controlling frequency becomes faster, control gain becomes decreasing.

NOTE:

1. In helicopter application, setting in 'Governor Low' or 'Governor High' is required. And we recommend to set the start type in 'Soft start' to get much smooth start for your helicopters.

2. In 'Governor Mode', the start time is generally between 10~45 seconds, which is different depend on the load.

3. In Governor Mode, the brake is always disabled and soft cutoff is automatically active.

- PWM Switching Rate

Option 1:8KHz(default)	Recommended for most brushless motors
Option 2: 12KHz	Recommended for low inductance motors
Option 3: 16KHz	Recommended for very low inductance motors

Note: we strongly recommend only the experienced modeler could change this setting.

Ⅹ **All models of Eurgle controllers**

Products	Voltage	Current/Surge	BEC	Dimension (mm)	Weight (with cables)
Eurgle ESC 20A-K	2~3S Lipo	20/30amp	2amp (Linear)	55×27×12	23g
Eurgle ESC 40A-K	2-3S Lipo	40/50amp	2amp (Linear)	55×27×12	25g
Eurgle ESC 60A-K	2-6S Lipo	60/70amp	4amp (Switching)	71×26.5×15	50g
Eurgle ESC 80A	2-6S Lipo	80/90amp	4amp (Switching)	71×26.5×15	52g
Eurgle ESC 100A-K	4-12S Lipo	100/120amp	no (OPTO)	69×52×24	109g
Eurgle ESC 150A-K	4-12S Lipo	150/180amp	no (OPTO)	94×59×38	282g
Eurgle ESC 200A-K	4-12S Lipo	200/230amp	no (OPTO)	94×59×38	294g
Eurgle USB Linker	Connector for speed controllers to PC				6g